Jan. 6, 1953

V. F. WIGAL

2,624,151

MAGNETIC DESCENDING TOY

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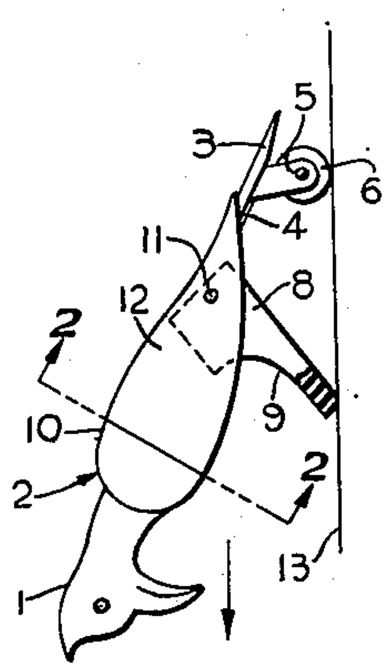

Fig. 1

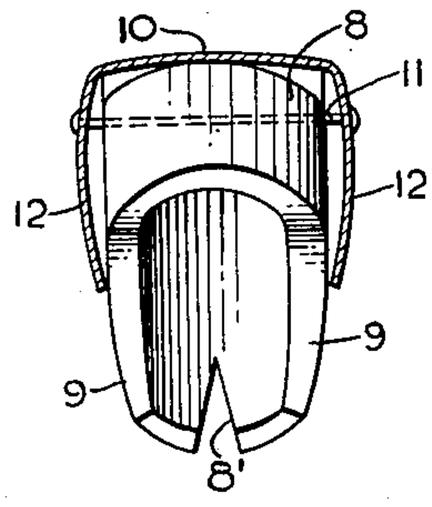

Fig. 2

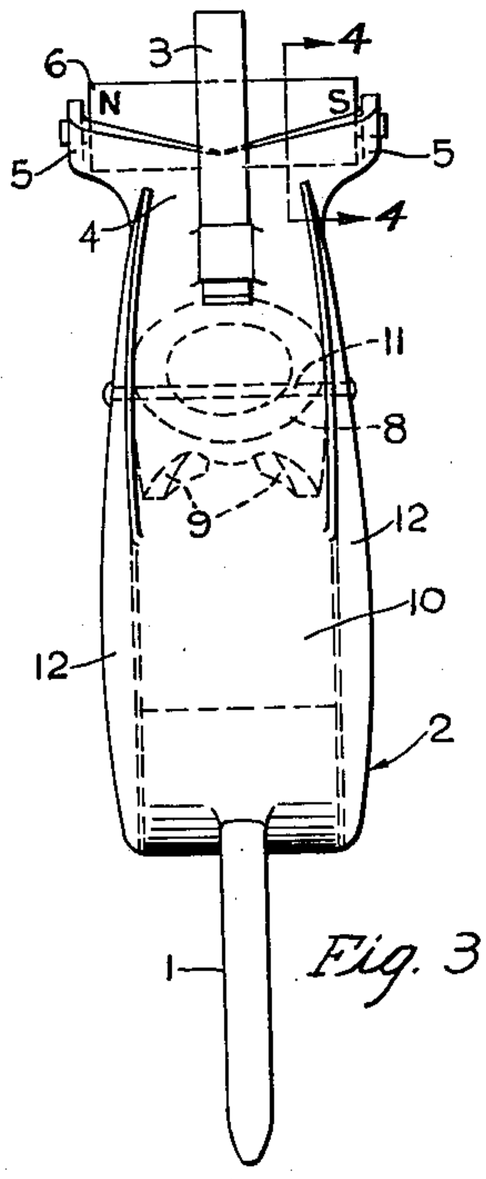

Fig. 3

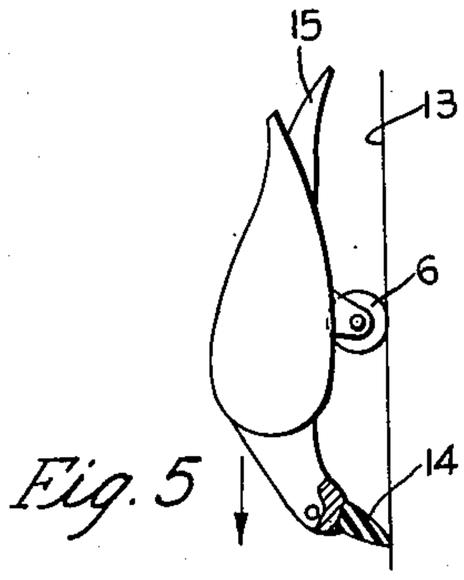

Fig. 5

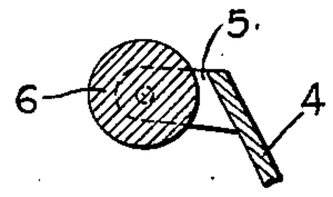

Fig. 4

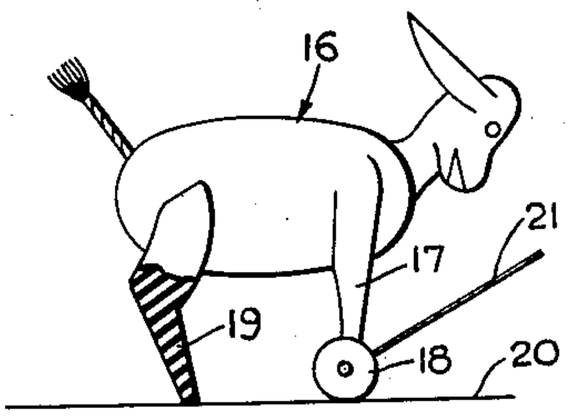

Fig. 6

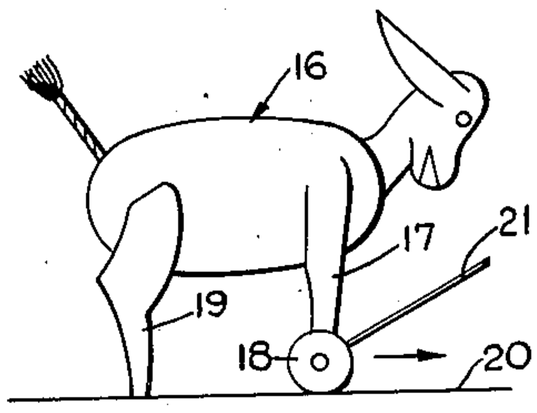

Fig. 7

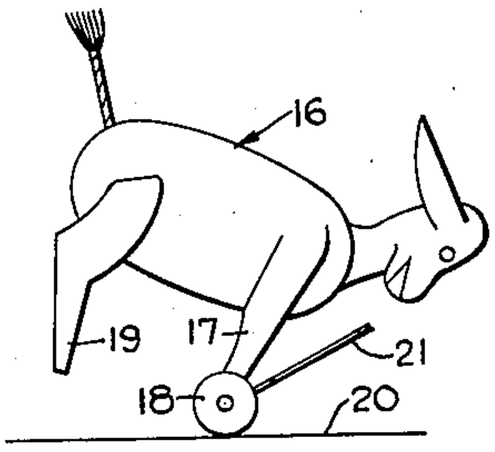

Fig. 8

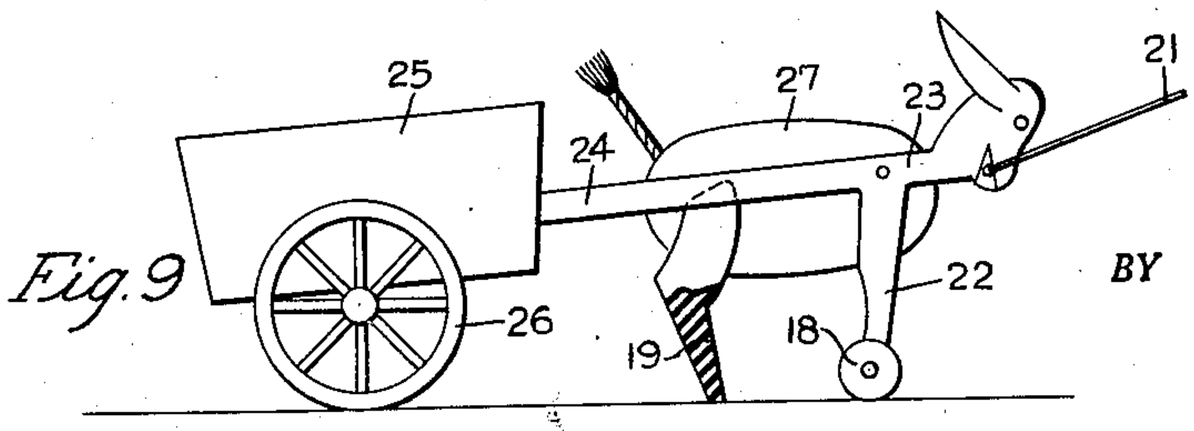

Fig. 9

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MAGNETIC DESCENDING TOY

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8 Claims. (Cl. 46—45)

1

This invention relates to a toy figure which is adapted to engage in a skipping or hopping action as it progresses along a surface. I have found that such animated behavior may be accomplished in a figure equipped with a surface-engaging member which is of resilient construction, and which is disposed at an angle to the surface over which it moves with the surface-engaging portion leading the member in the direction of progress.

The action is the same by whatever agency the figure is caused to progress, motor, hand-power, or the force of gravity, and the action takes place irrespective of the inclination of the surface, including the vertical.

It is, therefore, an object of the invention to provide a device which will bound intermittently as a consequence of resistance to motion along a surface. Another object is to provide a device having a means of constant support as it progresses along a surface and an auxiliary support in intermittent engagement during such progress. More particularly, it is an object to provide a device which bounds in response to interaction of a member with a surface when the device moves along the surface. In still greater particular, it is an object to provide a device which will cling to a vertical surface while descending therealong with oscillatory motion to and from the surface. A further object is to provide a toy figure which will simulate the bounding, hopping, or skipping motion of an animal.

These and other objects are attained by the invention, certain preferred forms of which are described in the specification below and illustrated in the drawings, in which:

Fig. 1 is a side elevational view of a toy bird adhered to a vertical wall in position for descent.

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a top plan view of the bird, enlarged;

Fig. 4 is a sectional detail taken on the line 4—4 of Fig. 3;

Fig. 5 is a view similar to Fig. 1 showing a bird with a modified bound-producing element;

Fig. 6 is a side elevational view of a toy donkey adapted for pulling along a surface;

Figs. 7 and 8 are views showing subsequent positions of the donkey of Fig. 6; and

Fig. 9 is a view similar to Fig. 6 with a cart added and a modified position of the pivot around which the bounding action occurs.

Referring to the drawings by characters of reference, there is shown in Fig. 1 a toy in the simulation of a woodpecker having a head 1, torso 2, and tail 3. An extension 4 of the torso, at the tail end of the bird, has a pair of downturned flanges 5 in which is journaled a roller 6. The latter is magnetic, with the poles as indicated in Fig. 3. The roller 6 is adapted to secure the bird to a vertical surface during descent therealong.

2

A rubber leg member 8 is fixed to the torso of the bird. The exact shape and size of this member can be varied in considerable degree while maintaining the novel action of this invention, the essential requirements being that it be resilient and disposed at an angle to the surface engaged by the bird. As shown in Figs. 1 and 2, the leg element 8 comprises a piece of rubber tubing from which a portion has been removed as at 9 to facilitate flexure of the leg. The upper portion of tube 8 abuts the underside of the back portion 10 of the bird and is held in position by a cross pin 11 carried by the wings 12 of the bird. The tube is notched as at 8′ to represent a pair of feet.

In operation of the Fig. 1 modification the figure is applied to a vertical, magnetically responsive surface 13 and released. The roller 6 holds the rear portion of the bird to the surface 13 and the weight of the bird tends to carry it downward, turning the roller 6. However, the resilient foot 8 offers frictional resistance to downward motion, with the result that it remains in engagement at a fixed point on the surface and downward motion of the bird results in a distortion of the leg 8 until the friction is overcome, whereupon the foot of leg 8 advances to a new position and, in straightening out, causes a swinging of the bird as a whole about the axis of roller 6. In the rapid descent of the bird, the duration of contact between leg 8 and surface 13 is of such brief interval that deformations in the leg are not perceivable and are, in fact, small. The action is similar to that of an escapement and proceeds according to a natural frequency requiring little energy storage in the leg 8 to cause the rebound of the figure.

The tail 3 is preferably formed of rubber or similarly resilient material so as to limit the amplitude of bobbing of the bird with a cushioned effect.

In Fig. 5 is shown a form in which the magnetic roller 6 is located somewhat forwardly of the tail and serves as the feet of the bird. In this case the beak 14 of the bird is the resilient or bouncing member and, as the bird descends the vertical surface 13, the body will oscillate about the axis of roller 6, being limited in amplitude by the rubber tail 16.

In Figs. 6 to 8, the principle is shown as applied to a pull type toy. A toy figure 16, a donkey for instance, has one or more fixed front legs 17 mounted on a pair of wheels 18 or other rolling device. The rear support for the donkey is provided in a leg or pair of legs 19 of rubber-like material, fixed at the upper end to the body of the donkey and inclined, at least at the lower end, to the supporting surface 20. The action is the same as in the case of the birds of Figs. 1 and 5 except that in the Fig. 6 modification, as pull is applied on pull cord 21, it is the rear of the animal which rises and falls about the axis of the roller support. In Fig. 7, it will be noted that the lower, thin portion of the leg 19 has been bent somewhat due to the fact that the figure has moved while the foot of leg 19 has not yet moved from its original point of contact with surface 20 and is storing energy to accomplish the leap of Fig. 8. This bending may be excessive, as shown, at the commencement of motion along the surface. However, once the action is started, the time of dwell of the foot on the surface is extremely short and the deformation of leg 19 is probably largely one of compression.

For proper operation, it is important that the wheels 18 contact the surface 20 continuously as in the case of rollers 6. Therefore, in the case of gravity held wheels or rollers, they should be weighted suitably.

In the Fig. 9 modification, the front leg 22 and neck 23 of the donkey are integral with the shaft 24 of a cart 25 having wheels 26. The body 27 of the animal is pivoted to the shaft 24 at the junction of the latter with leg 22. It will be seen that by this construction, not only is more weight available to hold down wheel 18, but that in addition the pull cord 21 may be attached at a higher elevation to the head of the animal, since the head does not take part in the oscillation and there is, therefore, less tendency to lift the front portion of the figure in pulling.

Obviously, in any form of toy chosen, the bouncing support may be located either forwardly or rearwardly of the constantly contacting support. For instance, in Fig. 9, the leg 22 could be moved rearwardly on the shaft 24 and the rubber leg 19 moved forwardly on the body 27. If the legs in the Fig. 6 modification were interchanged, the pull cord could be attached to the rear legs, or a push rod could be employed.

While certain preferred embodiments have been illustrated and described, the invention is not limited thereby and various changes in the size, shape, and arrangement, for instance, of the various parts may be resorted to without departing from the spirit or scope of the appended claims.

What is claimed is:

1. An animated toy having a support including a magnetic roller adapted to maintain the toy in contact with a steeply inclined surface, and a fixed arm extending from said toy in advance of said roller, at least the lower end of said arm comprising a material with elastic properties similar to rubber, and at least the lower end of said arm being arranged at an acute angle to the part of said surface between said roller and said arm.

2. An animated toy having a support including a magnetic roller adapted to maintain the toy in contact with a steeply inclined surface, a fixed arm extending from said toy in advance of said roller, at least the lower end of said arm comprising a material with elastic properties similar to rubber and at least the lower end of said arm being arranged at an acute angle to the part of said surface between said roller and said arm, and spring means on said toy rearwardly of said roller spaced from said surface when said arm is in contact therewith but positioned for contact with said surface when said arm is separated from said surface during oscillation of said toy about the axis of said roller.

3. An animated toy having a support including a magnetic roller adapted to maintain the toy in contact with a steeply inclined surface, a fixed arm extending from said toy in advance of said roller, at least the lower end of said arm comprising a material with elastic properties similar to rubber and at least the lower end of said arm being arranged at an acute angle to the part of said surface between said roller and said arm, and a second arm of rubberlike material on said toy, rearwardly of said roller, spaced from said surface when the first-mentioned arm is in contact therewith, but adapted to contact said surface when said first-mentioned arm is separated from said surface during oscillation of said toy about the axis of said roller.

4. A device as in claim 1, said toy being in the form of a bird, said arm located to simulate the legs of said bird, and said roller located in the vicinity of the tail of said bird.

5. A device as in claim 2, said toy being in the form of a bird, said arm located to simulate the legs of said bird, said roller located in the vicinity of the tail of said bird, and said spring means constituting the tail of said bird.

6. A device as in claim 1, said toy being in the form of a bird, said roller constituting the legs of said bird, and said arm constituting the beak of said bird.

7. A device as in claim 1, said toy being in the form of an animal, said arm constituting legs of said animal, and said roller located near the rear extremity of said animal.

8. An animated toy having a support including a magnetic roller adapted to maintain the toy in contact with a steeply inclined surface, a fixed, resilient arm extending from said toy in advance of said roller, at least the lower end of said arm comprising a material having a frictional resistance sufficient to impede downward progress of the toy, and at least the lower portion of said arm being arranged at an acute angle to the part of said surface between said roller and said arm, whereby on oscillation of said toy about the axis of said roller during descent the end of said arm intermittently contacts said surface to provide interruption to downward descent of said toy.

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